Municipal Development and Lending Fund (MDLF)

West Bank and Gaza (WBG)

Municipal Development Program (MDP)
For West Bank and Gaza: Phase 1

Environmental Management Plan (EMP)

June 2009
## List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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</thead>
<tbody>
<tr>
<td>EA</td>
<td>Environmental Assessment</td>
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<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>EMP</td>
<td>Environmental Management Plan</td>
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<td>EMSRP II</td>
<td>Second Emergency Municipal Services Rehabilitation Project</td>
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<tr>
<td>EAu</td>
<td>Environmental Audit</td>
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<td>EQA</td>
<td>Environmental Quality Authority</td>
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<td>EO</td>
<td>Environmental Officer</td>
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<td>EI</td>
<td>Environmental Index</td>
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<td>EEM</td>
<td>Environmental Evaluation Matrix</td>
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<td>PA</td>
<td>Palestinian Authority</td>
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<td>PO</td>
<td>Project Officer</td>
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<td>PRDP</td>
<td>Palestinian Reform and Development Plan</td>
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<td>LGCBP</td>
<td>Local Government Capacity Building Project</td>
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<td>LGU</td>
<td>Local Government Unit</td>
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<td>SEA</td>
<td>Strategic Environmental Assessment</td>
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<td>MDLF</td>
<td>Municipal Development and Lending Fund</td>
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<td>MDP</td>
<td>Municipal Development Program</td>
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<td>MOLG</td>
<td>Ministry of Local Government</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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<td>NGOs</td>
<td>Non-governmental Organizations</td>
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<td>PMO</td>
<td>Project Management Organization</td>
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<td>WB</td>
<td>World Bank</td>
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<td>WBG</td>
<td>West Bank and Gaza</td>
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1. Introduction
The Palestinian Authority (PA) has developed the Municipal Development Program (MDP) to support the Palestinian Reform and Development Plan, 2008-2010 (PRDP), which identifies fiscal autonomy and discipline at the local level as a key area of reform and highlights the need to build the operational, administrative and financial management capacity of local government bodies. It identifies the Municipal Development and Lending Fund (MDLF) as the primary source of development-linked assistance to municipalities and as a support mechanism for administrative and financial management reforms. MDLF works in close collaboration with the Ministry of Local Government (MoLG), responsible for regulating the sector and setting policies. MDP will provide performance based grants to municipalities, thereby creating incentives for municipalities to improve their performance.

To proceed with the preparation of any project under B environmental category, it is necessary to prepare an Environmental Impact Assessment (EIA) including Environmental Management Plan (EMP) as part of the procurement requirements under the Project. This environmental report shall be in compliance with the national and local policies, regulations and guidelines, besides, the World Bank (WB) policies and procedures.

2. EIA and EMP study for MDP phase 1 should provide the following key outputs

Identify the types, nature and scale of interventions under MDP project;
Determine based on knowledge of these interventions, whether the proposed investments may result in environmental or social impacts;
  ○ Propose mitigation and monitoring measures in the form of a project-EMP and applicable safeguard documentation to address potential impacts;
  ○ Evaluate the existing institutional capacity of the Local Government Units (LGU) to manage the recommendations for implementing the measures outlined in the EMP;
  ○ Provide recommendations to build capacity and strengthen environmental management;
  ○ Develop procedures to identify and address potential environmental and social safeguard issues of the projects;
  ○ Provide a detailed budget for mainstreaming environmental and social issues into the MDP phase 1 project budget.

The EMP is presented by this document. The document presents the environmental criteria for selecting the projects to be covered by MDP and give details for administering and monitoring the potential environmental impacts and their mitigation measures. The environmental matrices annexed to the EMP provide means to be considered during the main phases of the projects; design, implementation, operation, control and monitoring.

3. Objectives of Phase 1 of the MDP (2009-2012)
The objective of the first three years of MDP (phase 1) is to improve municipal management practices and services for better accountability. The key performance indicator is to graduate 60% of the municipality’s one level up the performance category in which they are currently classified, thereby contributing to the higher level goals of the MDP.

4. Implementation Arrangements
The MDLF, as the entity with the legal mandate to provide direct development assistance to municipalities, will be responsible for managing the MDP. In addition the MDLF is the PA’s preferred mechanism for channeling reform and development assistance to local governments in Palestine per the PRDP. To date, most of the funds were spent on emergency operations but
development projects are expected to become more relevant in upcoming years. Since its establishment, the MDLF portfolio of programs and projects includes about US $138 million from several development partners, including the World Bank, SIDA, the Dutch, AFD, Danida, KFW, GTZ, EU, Japan, and the Italian Cooperation, and carried forward the functions of previously existing project implementation units under MoLG. MDLF programs and projects could be categorized around the following support schemes: (i) Emergency support especially that related to infrastructure rehabilitation, and job creation; (ii) Development support which intend to foster the development agenda in the Palestinian Community despite the current deteriorated situation; (iii) Institutional Development and Technical Assistance support that goes in parallel with the infrastructure investments; and (iv) Innovative Window support to test and pilot certain government policies related to the local government development.

MDLF sets the ground work for Sector Wide Approach for municipal development and this will be the overarching program the MDLF will implement into which other projects and programs will be integrated over time. Projects implemented through the MDP will be supervised and managed by MDLF in cooperation with Municipalities and Joint Service Councils for Planning and Development.

5. Description of Phase 1 of the MDP
The first Phase of the MDP (2009-2012), has three Windows (Expected Total cost, US$130m, for program details refer to Annex 2: Detailed Description of MDP Windows):

(i) Window 1 - Municipal Grants for Capital Investments and Operations (80 percent of total program budget, approximately, US$64m – US$82.0m)
(ii) Window 2 - Grants to support Palestinian Authority Policy Priorities (10 percent of total budget, US$6.0m)
(iii) Window 3 - Capacity Building (i) for Municipalities and local government units and MDLF (US$4.0m)

6. Environmental Safeguards
This program will finance small investments which might have a small impact on the environment but can be easily mitigated. Therefore, the program is classified as environmental category B, in accordance with World Bank Operational Policy 4.01. Therefore, under the first phase of the MDP any sub-projects that would be classified as Category ‘A” would not be eligible for funding. The potential list of investments are likely to include: the construction, rehabilitation and maintenance of internal and access municipal roads, water and sanitation services, storm water drainage networks, maintenance of public facilities such as schools, health services centers, parks as well the construction, through an intensive labor methods, of addendums to schools, health centers and community centers, as well as other municipal assets that would generate municipal revenue streams. Therefore, some negative environmental impacts which are easily mitigated may occur due to the implementation of the rehabilitation and maintenance sub-projects. As a result, a detailed Environmental Management Plan (EMP) was prepared for the program with the aim to provide a review, analysis and recommendations of the best mitigation measures that the project management team shall consider during implementation.

The following list is illustrative of Category “A” sub-projects:

- Dams and reservoirs;
- Forestry production projects;
- Industrial plants (large-scale) and industrial estates;
- Irrigation, drainage, and flood control (large-scale);
- Land clearance and leveling;
- Mineral development (including oil and gas);
- Port and harbor development;
- Reclamation and new land development;
- Resettlement and all projects with potentially major impacts on people;
- River basin development;
- Thermal and hydropower development; and
- Manufacture, transportation, and use of pesticides or other hazardous and/or toxic materials.

**Screening of sub-projects:** The MDLF will screen all proposed sub-project as of the requirements of the World Bank Operational Policy 4.01 to insure compliance with the Bank's safeguard policies and that category “A” sub-projects are avoided. In addition, the screening will exclude subprojects that might trigger category “A” subprojects, involuntary resettlement, and physical cultural heritage per the World Bank Operational Policy 4.11 specific to Physical Cultural Resources and World Bank Operational Policy 4.12 related to Involuntary Resettlement. The screening process including documentations, checklists, and site-specific EAs and EMPs is detailed in the MDLF Technical Manual.

**The first window of Phase 1 of the MDP will finance:** (i) Municipal investments for the rehabilitation and reconstruction of municipal infrastructure and facilities, and the supply of equipment and spare parts to sustain municipal service provision; (ii) Infrastructure extension and new infrastructure established as priority investments in an approved short and medium term development plan; the proposals should be supported with a feasibility study; (iii) Non-wage recurrent expenditures as direct inputs for sustaining essential municipal services in Gaza (e.g. solid waste collection and disposal, chemicals for water disinfection etc., since current conditions in Gaza prevent the implementation of capital investments.

**Under this window, MDP will like to finance sub-projects from the following list:**

(i) **Water and wastewater services:**
Installation, maintenance and rehabilitation of new and/or existing municipal water and sewerage networks, wells and reservoirs; provision of chemicals for water purification (Gaza only); repair and maintenance of equipment, such as pumps, generators, vacuum tanks, and vehicles; purchase of spare parts (based on an existing maintenance plan), and fuel (Gaza only); the extensions of networks and purchase of new equipment and vehicles only for projects being part of the priorities of a municipal development plan.

(ii) **Solid Waste Management:**
Solid waste containers, tools, trucks and compactors (only if landfill operated by the municipality), spare parts for solid waste trucks, equipment and materials based on a solid waste management concept; in addition for Gaza: service contracts for solid waste collection, as well as labor, dumping fees, fuel, vehicle lubricants, insurance, and other related direct running costs for municipal service provision.

(iii) **Road rehabilitation and maintenance services:**
Goods and works for construction, maintenance, rehabilitation and reconstruction of new/existing internal roads, including traffic signs, road line demarcations, safety rails, traffic signals, street lighting, sidewalks, road maintenance tools and equipment; fuel and vehicle insurance (only in Gaza).

(iv) **Public Facilities:**
Rehabilitation and equipment of parks, kindergartens, youth centers, cultural centers, public market infrastructure, municipal buildings and facilities, and bus stations.

7. Institutional Structure
The implementation responsibility of this Program will be with MDLF with close cooperation and coordination with MoLG and the participating/eligible municipalities. The MDLF’s qualified core team will provide the continuity of the understanding of the World Bank and other donors’ environmental policies as well as the experience on the ground in monitoring and mitigating the anticipated environmental implications created by the implemented sub-projects. This Program would further develop such capacity for financing training to the environmental specialist at MDLF who would be responsible for reviewing, advising and reporting on environmental issues.

MDLF would also benefit from the services of a number of local consulting firms in both the West Bank and in Gaza who have been involved over the past 5 years in internationally financed municipal projects and have developed a good understanding of different donor’s environmental policies. These firms will be asked to carry out annual audit of the environment indicators and report on the compliance (or lack of it) with the EMP. Such experiences would be tapped to help MDLF in supervising sub-projects on the ground and providing advice and guidance on environmental issues and mitigation measures.

8. Environmental Audit of Sample Sub-Projects

1. A rapid environmental audit was carried out during the preparation of Municipal Management and Service Delivery Project (MMSDP), a project that was planned for Board presentation in May 2006. MMSDP was build on EMSRP’s institutional achievements and with greater focus on the local government development agenda. As the condition in West Bank and Gaza continued to deteriorate a demand for a second generation EMSRP was eminent. With the limited time on hand to prepare an EA for EMSRP II, it was agreed with the client that the EA prepared for MMSDP would be relevant since a number of subprojects that were audited may be financed by EMSRP II’s first component related to maintenance of local road networks as well as the second component related to labor intensive municipal service delivery and community services.

2. The audit was carried out by an independent consultant contracted by the client (MDLF) of 20 randomly selected locally prioritized sub-projects (17 in West Bank and 3 in Gaza) representing the type of sub-projects which EMSRP II would finance. The sample included sub-projects in the roads sub-sector (16 rehabilitation and maintenance of roads), education sector (3 maintenance and upgrading of schools/classrooms, a service that this within the municipal mandate especially in the West Bank), and other labor intensive types projects with minimum 50% of labor content.

3. The 20 sub-projects include 14 road sub-projects (13 roads and 1 road and sewage pipes), 3 educational (schools) sub-projects, 1 street lighting sub-project, and 1 street signing, marking and furnishing sub-project. The potential impacts would be those associated with:

   (i) Rehabilitation, maintenance and upgrading of roads and road networks (construction safety, noise, dust, waste material, and vehicular traffic);
   (ii) Provision of sanitary and electricity services; and
   (iii) Rehabilitation, maintenance and upgrading of schools.
4. A desk top review by the MDLF was carried for those types of sub-projects that are likely to be financed by EMSRP II but was not covered by the audit. This is primarily related to sub-projects that were financed by EMSRP in municipal services especially in the area of maintenance of water, wastewater, roads and electricity networks in addition to municipal waste collection and disposal. In addition to goods related to chlorine for water supply and insects and rodent control. The review relied on the various monitoring reports over the life of EMSRP.

5. In general, the audit and the desk top review yielded positive conclusions. All of the sub-projects will benefit local communities through: (i) improved access to essential social and other services, (ii) improved quality of environment and sanitation, (iii) more temporary employment opportunities during construction and more sustainable ones during operations and maintenance especially in communities with high rate of unemployment, (iv) will contribute to the preservation of valuable cultural and historical assets through improvement of the surrounding environment, improved access to them and therefore which may lead into job creation from improved internal and external tourism.

6. The audit and the desk top review have yielded positive conclusions. Both identified that most of these sub-projects will contribute positively to the communities in terms of improved access to essential social and other services, improved quality of environment and sanitation, will provide opportunities temporary employment opportunities during construction and more sustainable ones during operations and maintenance especially in communities with high rate of unemployment, will contribute to the preservation of valuable cultural and historical assets through improvement of the surrounding environment, improved access to them and therefore improved attention by the authorities to allocate the necessary resources for protection and preservation.

7. The audit and the review have highlighted that environmental impacts are expected to be minimal. These impacts would be easily mitigated by following the EMP prepared for the project. The potential impacts are related to a possible increase in gas emissions due to generated and/or increased traffic, increased level of noise, improper disposal of construction waste, potential for threat to cultural assets.

8. The potential adverse impacts would be restricted in scope and severity, such as:
   - Dust, noise and odor due to demolition and new construction;
   - Increased air pollution due to traffic congestion;
   - Increased traffic accidents;
   - Risk for aesthetic and vegetation;
   - Inadequate handling of construction waste;
   - Risk for road accessibility and health;
   - Excessive use of chemical dosage in water supply and pest control; and
   - Risk for cultural heritage assets.
9. ENVIRONMENTAL MANAGEMENT PLAN

1. OBJECTIVES AND FEATURES

The objective of the EMP is to cater to the environmental and social needs of the MDP in a simple, responsive and cost effective manner that will not unnecessarily overload or impede the project cycle. The EMP outlines the measures needed to address the issues identified in the EIA. Moreover, the EMP demonstrates proposed monitoring activities that encompass all major impacts and identify how they will be integrated into project supervision. The following are outlined in the EMP:

- Main environmental and social mitigation measures;
- Environmental training and capacity program; and
- Environmental and social monitoring.

The EMP can be considered as an audit of selected projects and an assessment of the potential impacts and mitigation measures. This EMP has been prepared based on the existing environmental situation and the auditing requirements. These requirements were realized after analyzing each of the 20 sub-projects and a sample of sub-projects financed under EMSRPI. The sample represents in general the types of sub-projects and sectors that MDP will finance and their anticipated impacts and identified mitigation measures. Based on the audit and assessment of the projects, the EMP highlighted the following elements:

- Site-specific environmental screening review and assessment of key environmental issues.
- An environmental audit of similar projects and regular maintenance and rehabilitation of essential infrastructure.
- Ensure adequate consultation during the assessment process.
- Develop an Environmental Monitoring Plan.
- Develop methodologies and procedures to be applied in context of the EMP.
- Grouping the sub-projects into sectors Roads, Water and Wastewater, Electricity, Solid waste, Public Buildings and Facilities and Chemicals.
- Identify linkages to other safeguard policies relating to the project.

2. ENVIRONMENTAL MANAGEMENT PLAN

The EMP is prepared in compliance with the Palestinian environmental laws and municipal bylaws. It provides tools for the evaluation and management of the impacted environmental parameters and they are:

- Dust and gases emissions
- Water (wastewater, surface water discharge, storm water)
- Construction waste
- Accidental risks
- Loss of vegetation
The risks and negative impacts of the proposed MDP projects can be minimized by addressing mitigation measures during construction and post-construction operation phases. Annex 1 presents matrices detailing representation of the environmental and social impacts typically associated with the type of projects. These environmental matrices show the expected impacts covered by the projects, sector wise, and list the mitigation measures proposed to be implemented during and after the construction of the projects.

The risks and negative impacts of the proposed projects can be minimized by addressing mitigation measures during construction and post-construction operation phases. The matrices in Annex 1 are detailed planning and environmental matrices of selected project sectors. They summarize the expected impacts of each sector and the suggested mitigation measures.

The EMP also includes specific guidelines as mitigation measures for safe handling of the pests and management for the insects and rodent control (please see Annex 2 entitled Pest Management Plan). These guidelines have been authorized by the Palestinian Ministry of Health. The EMP has also included some mitigation measures that should be considered while handling of potential PCB containing transformer oils (please see Annex 3 entitled “Guidelines for Handling of Potential PCB Contaminated Oils and Components”).

The EMP elaborated the requirements for the environmental management and monitoring of the Municipal Infrastructure and Services Audit (MISA) projects and provided tools for the environmental auditing. The overall assessment is provided by means of general judgment and statements using tables, which can be summarized that the MISA projects are positive and their impacts are manageable and can be controlled.

3. ENVIRONMENTAL SCREENING AND REGISTERING

Environmental Screening (ES) would take place at an early stage of the MDP subproject cycle and the screening and review process will be conducted by the Environmental Specialist at MDLF. A standard appraisal and mitigation matrix will be part of the specific specifications for the contractor, and will form the basis of regular monitoring. The EMP matrix consists of sectors, phase, and potential environmental impacts, if any, due to the project, mitigation measures, operation and supervision.

4. ENVIRONMENTAL CONSULTATION, REVIEW AND ASSESSMENT

The MDLF will have the responsibility of reviewing and assessing the environmental feasibility of the proposed sub-projects. This will be carried out by the MDLF team who has prior experience from previous projects including EMSRP I and EMSRP II but will receive additional environment specific training during the life of the project. The MDLF team will also liaise with key stakeholders including EQA and the recipient municipalities. The team will also liaise with the appropriate officials from the Department of Antiquities at the Ministry of Tourism and Antiquities where needed.

As part of the preparation phase of MDP program and the sub-projects, and in order for MDLF to ensure proper public consultation, MDLF conducted six workshops during the months of March and April 09. About 200 people attended representing 107 Municipalities in all the Palestinian Governorates in the West Bank. In those workshops MDLF staff explained the MDP program and
also presented the draft environmental management plan. All attendees emphasized on the importance of EMP and that it should be directly related to the type of sub-projects financed under the program and that there should be clear laws and regulations to foster its importance.

During the project life cycle, MDLF will always ensure to conduct more public consultation and that municipalities, NGO’s, and any other public forums will observe a proper public participation process and will be informed about any possible adverse environmental effect and their approval will be obtained once the necessary mitigation measures have been considered.

An environmental audit of a sample of implemented sub-projects will be carried on an annual basis by specialized consulting firms recruited by the MDLF and financed by the project. This consultant will also assess the MDLF team capacity and performance and recommend areas that need further strengthening.

Environmental assessment takes place during the second stage of the project life cycle (preparation of project document). Projects classified under category "B" would be subject to a focused EA. A simple EIA would be required and should identify and include the relevant mitigation measures. Mitigation measures indicated in the EMP should be included in the project design and reflected in the project document.

5. Potential Environmental Impacts:
MDP include activities that will, as per project sector, mainly have positive environmental impacts for most sectors. Positive impacts identified include the following:

**Sewage and Water Projects:** Sewage and water projects improve the public health of the local communities and will provide ground water protection.

After construction, the implemented projects will have no impacts on most of the physical environmental factors such as noise, dust, and air pollution. Water projects will improve the quality and quantity of water and ensure more system efficiency. The rehabilitation and maintenance of water networks will also reduce the losses due to water leakage and illegal house connections. Sewage projects will improve the health conditions, reduce leakage and have positive impact on water resources.

**Supply Tools and Equipments:** Such projects improve the capacities of the local community staff and enable them to carry out their tasks with less time and in safe environment. The provisions of sewer cleaning equipment, as an example, will adequately maintain the flow capacity of the sewers and will prevent damage during the cleaning operation.

**Road Projects:** Reduce or prevent dust, improve drainage, minimize disturbances and obstacles and ensure road safety, especially in roads close to schools and markets. Pavement and sidewalks add positively to the people’s attitude towards preserving these assets and therefore keeping their localities clean and safe.

**Rehabilitation of Buildings:** Generally, the rehabilitation of schools, clinics, public centers or other buildings will increase the capacity of employees and improve the work environment. Building maintenance projects improve the physical conditions of the structures and improve safety conditions.

**Solid waste projects:** Solid waste management practices ensure natural resources protection, fewer and safer disposal sites, clean environment and minimization of environmental, cultural, social, and economic effects. The awareness activities of this sector will increase the efficiency of collection system and control illegal dumping sites. Provision of tools and equipment will enhance cleaning of
streets and thus improve the health conditions; accumulation of wastes in roads and residential areas will be minimized or eliminated.

**Electricity:** Improvement of electricity services will improve the living and safety conditions of the people. Provision of street lighting will improve the traffic condition in heavy populated areas and will have positive impacts on accessibility and minimization of accidents and risks.

As shown above environmental impacts are different from project to another according to the project type. The following tables (matrices) are listing of the overall main environmental impacts of the projects based on the different sectors of public facilities, electricity and power generation projects, road maintenance projects, solid waste projects and agricultural services projects. The tables list the expected environmental impacts and indicate whether the impact is positive, negative or neutral (no impact). These impacts are estimated based on the general information available at this stage of the project. Later and after detailed information of the projects are provided, these Environmental Evaluation Matrices (EEMs) can be modified. Two points should be made with regard to the EEMs: (i) that the positive and ‘no-impact’ categories could degenerate to negative if caution is not exercised; and (ii) these impacts are often ‘site-specific’ and this should be taken into consideration.

Table 1A is the EEM of the public facilities projects. These projects have mostly positive impacts, but will increase the construction wastes and produce noise and dust during construction. Therefore, management of the construction wastes and reduction measures of noise and dust are required to mitigate these impacts.

Table 1A: Main Environmental Impacts due to public facilities projects

<table>
<thead>
<tr>
<th>No.</th>
<th>Environmental Component</th>
<th>Impact</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>1.</td>
<td>Air Quality</td>
<td></td>
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<tr>
<td>2.</td>
<td>Groundwater Quality</td>
<td>X</td>
</tr>
<tr>
<td>3.</td>
<td>Community Water Supply</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Public Health and Services</td>
<td>X</td>
</tr>
<tr>
<td>5.</td>
<td>Workers Health and Safety</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Dust and Noise Reduction</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Cultural and Heritage</td>
<td>X</td>
</tr>
<tr>
<td>8.</td>
<td>Socio-economic</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Water Courses and Wadis</td>
<td></td>
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<tr>
<td>10.</td>
<td>Forests and Biodiversity Areas</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Aesthetic</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Waste Reduction</td>
<td></td>
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</tbody>
</table>

Table 1B is an EEM for the electricity and power conservation projects. The table indicates that the electric projects have equal number of crosses for negative and positive impacts, but this does not
mean that the overall assessment of the project is neutral. Mitigation measures should be considered for the negative impacts. In addition, the impacts have different weighting factors in regard of their importance and this should be taken into consideration.

Table 1B: Overall Main Environmental Impacts due to electricity and power conservation projects

<table>
<thead>
<tr>
<th>No.</th>
<th>Environmental Component</th>
<th>Impact</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>1.</td>
<td>Air Quality</td>
<td>X</td>
</tr>
<tr>
<td>2.</td>
<td>Groundwater Quality</td>
<td>X</td>
</tr>
<tr>
<td>3.</td>
<td>Community Water Supply</td>
<td>X</td>
</tr>
<tr>
<td>4.</td>
<td>Public Health and Services</td>
<td>X</td>
</tr>
<tr>
<td>5.</td>
<td>Workers Health and Safety</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Noise Reduction</td>
<td>X</td>
</tr>
<tr>
<td>7.</td>
<td>Gas emissions</td>
<td>X</td>
</tr>
<tr>
<td>8.</td>
<td>Cultural and Heritage</td>
<td>X</td>
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<tr>
<td>9.</td>
<td>Socio-economic</td>
<td>X</td>
</tr>
<tr>
<td>10.</td>
<td>Accidental risks</td>
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<td>11.</td>
<td>Water Courses and Wadis</td>
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<td>12.</td>
<td>Forests and Biodiversity Areas</td>
<td>X</td>
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<tr>
<td>13.</td>
<td>Aesthetic</td>
<td>X</td>
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</table>

The road projects include construction and/or rehabilitation of roads. It may also include improvement of roads by adding signs, lighting, etc. Table 1C presents the EEM for road maintenance projects. Rehabilitation of the roads will increase the traffic volume and result noise and dust emission. The gases that will be emission form the cars will affect the air quality. Accidental risks and workers health and safety will be impacted. The water courses and wadis will be also impacted if the drainage systems of the roads are changed.

Table 1C: Overall Main Environmental Impacts due to road maintenance projects

<table>
<thead>
<tr>
<th>No.</th>
<th>Environmental Component</th>
<th>Impact</th>
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<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td>1.</td>
<td>Air Quality and Gas emissions</td>
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<tr>
<td>2.</td>
<td>Groundwater Quality</td>
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<tr>
<td>3.</td>
<td>Community Water Supply</td>
<td>X</td>
</tr>
<tr>
<td>4.</td>
<td>Public Health and Services</td>
<td>X</td>
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</tbody>
</table>
6. ACTIVITIES ASSOCIATED WITH CONSTRUCTION AND OPERATION PHASES OF PROJECTS

Both construction and operation phases involve activities that can be associated with impacts on the surrounding environment and need to be closely monitored by MDLF team. The project activities during construction and operation are detailed and related in Tables 2 and 3 identifying the potential impacts on the significant environmental issues.

i. Construction Phase

Concerns generally exist in many of the project categories (education, health, transportation, water supply, etc.) during the construction phase. These concerns are usually minor and can be easily addressed using appropriate mitigation measures in the civil works contracts. The most important issues include:

- Construction and demolition waste
- Risk of damage to archaeological or historical sites
- Risk of destruction of wildlife habitats
Table 2: Construction Activities and Potential Impacts

<table>
<thead>
<tr>
<th>Significant Environmental Issues</th>
<th>Agricultural Resources</th>
<th>Water Resources</th>
<th>Air Quality</th>
<th>Cultural and Historical Resources</th>
<th>Socio-economic Conditions</th>
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<tbody>
<tr>
<td>Demolition</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Removal of Existing Infrastructure</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Heavy Machinery Operation</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Construction of Infrastructure</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Excavations and Earthwork</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Construction of Buildings and Facilities</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Material Procurement</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Waste Disposal (solid, liquid, hazardous, etc.)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Wastewater Disposal</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Accidents and Unplanned Events</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**ii. Operation Phase**

These are concerns most typical in the operation of subprojects, primarily in the education and health sectors. General issues during operation include:

- Availability of functioning and maintained sanitation facilities (sometimes not functioning due to a water shortage);
- Improper disposal of municipal wastewater; (e.g. establishments such as schools or healthcare units may dispose their wastewater in percolation pits without conducting an assessment of the surrounding environment, so it is important to identify its sensitivity and accordingly whether there are potential environmental and/or public health risks); and
- Improper management of municipal solid waste generated by the subproject (and other potential sources). This usually results in the accumulation of municipal waste on or around the subproject premises/area.
Table 3: Operational Activities and Potential Impacts

<table>
<thead>
<tr>
<th>Project Activities</th>
<th>Significant Environmental Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agricultural Resources</td>
</tr>
<tr>
<td>Transportation</td>
<td>√</td>
</tr>
<tr>
<td>Power Generation</td>
<td></td>
</tr>
<tr>
<td>Water Supply</td>
<td></td>
</tr>
<tr>
<td>Solid Waste Collection and Disposal</td>
<td>√</td>
</tr>
<tr>
<td>Wastewater Collection and Disposal</td>
<td>√</td>
</tr>
<tr>
<td>Educational Training</td>
<td>√</td>
</tr>
<tr>
<td>Production and Investments</td>
<td></td>
</tr>
<tr>
<td>Landscape Irrigation</td>
<td>√</td>
</tr>
<tr>
<td>Accident and Unplanned Events</td>
<td>√</td>
</tr>
<tr>
<td>Overall Project Development</td>
<td>√</td>
</tr>
</tbody>
</table>

iii. **Safeguard risks associated with subprojects**

Certain types of small-scale projects can be considered high risk (e.g. new rural roads, waste treatment plants) while others can be considered low risk (rehabilitation of wells and boreholes, construction of classrooms). High-risk subprojects are those that require a site specific EA or detailed EMP because they present potential adverse environmental and social risks. Low-risk subprojects are those that have minimal to no impacts and can be managed through the insertion of clauses within the construction and supervision contracts. Some types of projects such as training and capacity building or dissemination of toolkits and school accessories do not present any risk and can be appraised without any safeguard measures.

iv. **Cultural Heritage and Physical Cultural Resources**

The definition of physical cultural resources include any movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above or below ground, or under water. Their cultural significance may be at the local, provincial or national level, or within the international community. MDLF will not finance any sub-project that might trigger OP 4.11.
In case of accidental findings of any antiquities or physical cultural resources that might occur during the implementation of the sub-projects, the contractor must notify MDLF and the municipality immediately. According to the applicable Jordanian Heritage law No. 51 for the year 1066, Article 15 MDLF must stop the contractor and notify the related Authority (Ministry of Tourism and Antiquities) within 3 days to take the necessary actions.

v. **Involuntary Resettlement**

MDLF will not also finance subprojects including proposed investments to cause any involuntary resettlement for community groups.

Table 4 provides an illustration of these safeguard risks. Annex 1 presents matrices detailing representation of the environmental and social impacts typically associated with the type of projects of MDP. These environmental matrices show the expected impacts covered by the projects, sector wise, and list the mitigation measures proposed to be implemented during and after the construction of the projects.
<table>
<thead>
<tr>
<th>MDP Investments</th>
<th>No Risk</th>
<th>Low Risk</th>
<th>High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Construction of classrooms</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Teacher housing</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fencing</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Provision of classroom furnishings</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• School supplies and medical kits</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Laboratories</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sports fields/recreation facilities</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Functional adult literacy activities</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Water Supply</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Water point rehabilitation</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tertiary distribution piping</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rehabilitation of wells and springs</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Spring protection</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Community reservoirs</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Drainage canals</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Water harvesting facility</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Water treatment plant (house and community units)</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Hand pumps and mechanized boreholes</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Gravity water schemes</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sanitation and Waste Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Washing facilities</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Public toilets/ pit latrines</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sewerage facilities and collection</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sewage treatment units</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Soak pits and septic tanks</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Waste disposal facility</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Solid waste landfill</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Wastewater systems</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Construction of health centers</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Healthcare waste management</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Dispensaries</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Emergency rooms</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Maternity clinics</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Health control centers</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Laboratories</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transportation, Communication and Energy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tertiary and secondary level roads</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Primary level culverts and bridges</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Footpaths</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rural telephone</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rural electrical distribution</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Retaining walls</td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. ENVIRONMENTAL MITIGATION AND AUDITING

The primary objective of environmental management plan is to define the necessary mitigation measures that would be considered / implemented at the various stages of project implementation (design, construction and post construction). The type and magnitude of the impacts vary from one sub-project to another depending on the scale, local hosting environment and tools adopted for physical implementation.

The environmental audit adopted a methodology of consultation and requesting feedback from potential beneficiaries through a well designed and structured questionnaire. The questionnaire covered public and environmental health, water and sanitation, solid waste, noise and psychological comfort, land use, air pollution and public safety.

The results of the questionnaire are considered as indicators of the improvements in the different environmental subjects. Both positive and negative impacts on the environment and social life are presented in details as the findings of the environmental audit. Environmental auditing is recommended during the different phases of the project to ensure further assessment of the impacts and to control their effects. The following environmental matrix shows the expected impacts covered by the reviewed sub-projects and lists the mitigations to be implemented prior, during and post the construction phase of the sub-projects.

Environmental mitigation and monitoring actions are presented in a matrix format (Annex 1). The matrix includes identifying the issues, mitigation measures, and responsibility for carrying out the mitigation measures, environmental monitoring, and responsibility for carrying out the monitoring actions.

In order to implement sufficient and adequate EMP in terms of project monitoring, reporting and supervision, the following actions are recommended:

1. Site-specific environmental screening and review process conducted at least two times a month for randomly selected projects. Environmental review shall be conducted for specific projects that have been earmarked to be subjected to detailed site review. A standard appraisal and mitigation form or checklist is recommended to be used. The form or checklist should basically include:
   o Current environmental problems such as water supply contamination, dust and air pollution at the site.
   o Any potential environmental impacts of the project.
   o Mitigation measures.

2. Prepare a monthly progress report (Environmental Audit (EA)) addressing the environmental issues, status of mitigation measures taken and recommendations.

3. Review the existing Palestinian environmental laws and regulations. For this purpose the two main articles 45 and 47 of the Environmental law of Palestine of 1999 and the Palestinian Environmental Assessment Policy are presented in Annex 4.

8. LEGAL ENVIRONMENT

The Palestinian Environment Strategy (PES) was published in October 1999 by EQA. It covers the political and social context, the legal and institutional framework, the environmental driving forces, the environmental themes and strategy elements. Annex 4 below describes the Palestinian Environmental Law and the Palestinian Environmental assessment Policy. All mentioned laws, orders and regulations have enforcement power, the main base of the enforcement system is the Jordanian Public Health law # 43 and the municipality regulatory system. Enforcement actions are
usually taken by the municipality directly in some cases and through the Soluh court, the police and sometimes the district governor for much complicated cases.

EQA has completed their environmental assessment policy and implementation the procedures. Within the terms of the draft policy, EQA is responsible for the implementation and the approval and assessment of environmental considerations in relation to proposed developments. MDLF will liaise with relevant institutions such as EQA and PWA in relation to the proposed sub-projects.

The form of the policy is similar to that of the World Bank and does not contradict with it, and it specifies the requirement for comprehensive EIA’s for projects likely to have significant impacts and an initial Environmental Evaluation IEE for projects where significant impacts are uncertain, or where compliance with environmental regulations must be insured.

As noticed from Annex 4, the prevailing EA procedures are those of such as the EC Directive 85/337 and 97/11/EC and World Bank Operational Policy / Bank Procedures/Good practice (OP/BP/GP 4.01) and associated documents.

9. EMP Cost Implication and Schedule

Table 5 presents a tentative implementation schedule for the actions of EMP. The actions are listed as per the major project activities. The cost implication of the EMP and the fees are listed in the last column of Table 5.

EMP and Monitoring Cost Estimate: The cost associated with implementing the EMP and monitoring of environmental safeguards is accommodated by the project and estimated at US$249,900. The project will finance as part of the MDLF’s management fee the remuneration of an environmental specialist as a member of its core team. While, the cost of related designs, clean up and disposal of construction debris and waste will be included in the sub-project contract financed by the Grant. This is estimated to cost on average around 3-5% of the municipal grants.

The cost of supervision and monitoring the EMP as well as the proposed training programs addressed to municipal staff and eligible contractors will be part of the Terms of Reference of the Local Technical Consulting firms (LTC) to be contracted by the MDLF for the entire life of the MDP. The Terms of Reference of these firms will be developed by the MDLF and will be sent to MDP donors to obtain their approval. The LTC will report on semi-annual basis the compliance with the EMP and recommend actions for non-compliance cases.

The costs associated with implementing post construction measures will be financed through the annual municipal budgets for operations and maintenance of assets and infrastructure. During the supervision missions, the donor’s team will review at random a sample municipal budgets and confirm that such budget include specific line items for post project mitigation measures.
### Table 5: EMP Cost Estimate:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Quantity</th>
<th>Unit Rate in US$</th>
<th>By Whom</th>
<th>Total in US$</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Environment Specialist at MDLF (Will be part of the MDLF management fee)</td>
<td>36</td>
<td>1,800/month</td>
<td>MDLF</td>
<td>64,800</td>
<td>Workshops will be conducted in the preparation phase of the MDP by MDLF environmental Specialist with the Assistance of the LTC’s. Workshops will be organized to include every municipality in each governorate.</td>
</tr>
<tr>
<td>2) Capacity Building and Training (workshops)</td>
<td>10</td>
<td>3,000</td>
<td>LTC/MDLF</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>3) Environment Assessments for subprojects were needed (local consultancy)</td>
<td>20</td>
<td>5,000/assessment</td>
<td>Municipalities</td>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td>4) Random Environmental Audits through consulting firm</td>
<td>3</td>
<td>15,000/year</td>
<td>LTC</td>
<td>45,000</td>
<td></td>
</tr>
<tr>
<td>5) Miscellaneous</td>
<td></td>
<td>10,000</td>
<td>MDLF</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>6) Accidental Findings</td>
<td>3</td>
<td>5000/year</td>
<td>MDLF</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>264,800</strong></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** The above budget is exclusively devoted to environmental monitoring. Items 1 and 5 will be part of the MDLF’s budget while Items 2, 3 and 4 will be part of the TORs for the Local Technical Consulting firms (LTC) who will be contracted by the MDLF for the life of the project. Cost of design and implementation of mitigation measures will be financed from the grants issued to the municipalities and not from the above budget. It is estimated that such costs would be on average around 3-5% of the municipal grants.
10. Environmental Capacity Building and Training Program

The MDLF and through its Institutional Development and Technical Assistance Department (IDTA) and in cooperation with EQA will initiate specifically tailored environment related training to municipal project related officials. It will also liaise with the Palestinian Engineers Syndicate and the Contractors Association to carry out similar training tailored to contractors. Training will be conducted both in the West Bank and in Gaza.

In order to ensure proper implementation of the environmental screening and mitigation measures, the MDP will undertake a series of workshops of environmental training and institutional capacity building. The environment capacity building on the preparation and implementation of EIA and EMP would be for, but not limited to, participating LGU staff, volunteers, contractors, and local environmental consultants. The EA process as well as roles and responsibilities will be presented and discussed. During the workshop, guidelines and checklists will be provided and explained.
Annexes

ANNEX 1: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN MATRIX
ANNEX 2: PEST MANAGEMENT PLAN
ANNEX 3: MAINTENANCE AND REPLACEMENT OF POLYCHLORINATED BIPHENYLS (PCBs) BASED ELECTRICAL TRANSFORMERS
ANNEX 4: ENVIRONMENTAL LEGISLATION AND REGULATIONS
## Annex 1

**Environmental Management and Monitoring Plan Matrix**

<table>
<thead>
<tr>
<th>No.</th>
<th>Sector</th>
<th>Phase</th>
<th>Impact</th>
<th>Mitigation Measure</th>
<th>Operation / Responsibility</th>
<th>Supervision</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Road Sub-Projects</td>
<td>Construction</td>
<td>Dust generated by construction activities.</td>
<td>Monitor the excavations. Applying (spraying) water where possible. Avoid work during windy days.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Proper activity scheduling and working hours and days.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Increasing the concentration of pollutants and noise.</td>
<td>Proper scheduling and working hours and of any risky activities.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Increase the risk of accidents during construction.</td>
<td>Traffic regulation signs and Traffic calming measures.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Use signs to control speed limit.</td>
<td>Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Provision of adequate notification procedures for any road closures</td>
<td>Contractor and Consultant</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Loss of aesthetic features due to illegal dumps.</td>
<td>Monitor the using of safety measures.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dump at proper and approved sites.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Potential accidental break of other water lines and other utilities.</td>
<td>Survey of existing facilities during the design. The contractor consults relevant utilities, agencies or companies.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post-construction</td>
<td>Construction waste generated.</td>
<td>Proper plans for disposing off construction waste including waste generated from used machinery (used oil) to be included in the contract documents.</td>
<td>Consultant</td>
<td>Municipality</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Due to obstruction, traffic concentration will be transferred to other streets causing traffic congestions.</td>
<td>Monitor the use of traffic signs, safety measures and tools.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Long-term traffic increase.</td>
<td>Traffic signs to reduce the traffic (one-way sign) and traffic calming signs.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Increase the risk of accidents.</td>
<td>Traffic regulation signs and traffic calming measures.</td>
<td>Consultant</td>
<td>Municipality</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cumulative increase in dust and gas emissions because of more traffic movement.</td>
<td>Control the traffic speed. Maintain vegetation cover. Regular checks of vehicle.</td>
<td>Municipality</td>
<td>MDLF/LTC</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maintenance of new assets (roads and associated wastewater and storm drainage networks)</td>
<td>Prepare an annual maintenance plan as well as setting an allocation for the necessary financial resources in the annual budget.</td>
<td>Municipality</td>
<td>MDLF/LTC</td>
<td>MDLF/LTC</td>
</tr>
<tr>
<td>2</td>
<td>School and Health facilities Sub-projects</td>
<td>Dust generated by construction activities.</td>
<td>Monitor the excavations, applying (spraying) water where possible. Avoid working during windy days.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-construction</td>
<td>Increase the risk of accidents.</td>
<td>Proper scheduling of any risky activities.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Traffic signs to ensure proper routing and distribution of traffic.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction waste generated and left in site.</td>
<td>Clear site management plans and dumping at proper and approved sites.</td>
<td>Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improper disposal of generated waste.</td>
<td>Ensure that the facilities are connected to either wastewater network and if not available to a septic tank that is regularly maintained.</td>
<td>Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss of aesthetic due to the increase in built-up areas.</td>
<td>Design of landscaping around the facility.</td>
<td>Consultant</td>
<td>Municipality</td>
<td>MDLF/ LTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Noise around the facility by traffic movement.</td>
<td>Traffic regulation signs and traffic calming measures.</td>
<td>Consultant</td>
<td>Municipality</td>
<td>MDLF/ LTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improper disposal and pile up of construction wastes</td>
<td>Cleaning and removal of wastes to landfills or designated areas.</td>
<td>Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical Waste generated from operating the health facilities</td>
<td>Separation and disposal of the Medical Waste per the local regulations and international standards.</td>
<td>Operator of facility</td>
<td>Municipality and Ministry of Health</td>
<td>Ministry of Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inadequate functioning of the wastewater collection system.</td>
<td>Ensure systematic maintenance of the network/septic tanks.</td>
<td>Municipal Maintenance Department</td>
<td>Municipality</td>
<td>MDLF/ LTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Maintenance of water, wastewater, storm drainage networks</td>
<td>Increasing the concentration of pollutants, noise and odor.</td>
<td>Proper scheduling and monitor of any risky activities.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-construction</td>
<td>Dust generated by construction activities.</td>
<td>Monitor the using of safety measures and tools.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Loss of aesthetic features due to illegal dumps.</td>
<td>Proper plans for disposing of broken pipes, manholes and other waste to be included in the contract documents.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction waste generated.</td>
<td>Clear site management plans and dumping at proper and approved sites.</td>
<td>Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regular maintenance of networks</td>
<td>Monitor the clogging or breakage in the network and respond immediately to maintain it. Ensure that disposal of wastewater is done properly.</td>
<td>Municipality</td>
<td>Municipality</td>
<td>MDLF/ LTC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Road Lighting and/or Furnishing Sub-projects</td>
<td>Risks during maintenance activities (electric shocks, fallen objects, cutting wires).</td>
<td>Maintenance activities should be carried out in off-peak periods.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>Electricity cut off due to maintenance activities.</td>
<td>Follow safety measures and conditions.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/ LTC</td>
<td></td>
</tr>
<tr>
<td>5. Maintenance and Replacement of Electric Transformers</td>
<td>Post-construction</td>
<td>Electricity poles hinder the movement and traffic.</td>
<td>Relocate electricity poles.</td>
<td>Consultant and Contractor</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
<td></td>
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<td>--------------------------------------------------------</td>
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<tr>
<td>6. Use of Pesticides</td>
<td>Project Implementation</td>
<td>Negative impact on ground water.</td>
<td>Separate guidelines for handling of Polychlorinated Biphenyls (PCB) and PCB-free insulating oil and insulating oil components is included in Annex 3.</td>
<td>Municipal Maintenance Department</td>
<td>Municipality and Supervision Engineer</td>
<td>MDLF/LTC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Project Implementation</td>
<td>Negative impacts on human health especially those with Asthma or due to over dose application.</td>
<td>Ensure that only WHO approved pesticides is used.</td>
<td>Municipality</td>
<td>MDLF/Supervision Engineer</td>
<td>MDLF/LTC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ensure that residents are alerted in advance on the location and timing of spraying the pesticides.</td>
<td>Municipality</td>
<td>Supervision Engineer</td>
<td>MDLF/LTC</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Application should be carried out during low activity hours.</td>
<td>Municipality</td>
<td>Supervision Engineer</td>
<td>MDLF/LTC</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Ensure that pesticides are packaged, labeled, handled, stored, disposed of, and applied according to standards acceptable to the Bank. ¹</td>
<td>Municipality</td>
<td>Supervision Engineer</td>
<td>MDLF/LTC</td>
<td></td>
</tr>
<tr>
<td>7. Uncovered Historical and Cultural Heritage Assets</td>
<td>Accidental excavation of cultural heritage and archaeological assets.</td>
<td>Stop construction activities. Immediately notify Ministry of Tourism and Antiquities (MOTA).</td>
<td></td>
<td>Contractor</td>
<td>MOTA &amp; LTC</td>
<td>MDLF/LTC</td>
<td></td>
</tr>
</tbody>
</table>

General Comment: The contractor shall communicate closely with all relevant parties prior and during the construction phase including MUNICIPALITY, EQA and Department of Antiquities at the Ministry of Tourism and Antiquities.

¹ The FAO’s *Guidelines for Packaging and Storage of Pesticides* (Rome, 1985), *Guidelines on Good Labeling Practice for Pesticides* (Rome, 1985), and *Guidelines for the Disposal of Waste Pesticide and Pesticide Containers on the Farm* (Rome, 1985) are used as minimum standards.
Annex 2

Pest Management Plan

Introduction

Many municipalities in the West Bank and Gaza are responsible for providing the necessary services for protecting and controlling the public health from pests and other kinds of reptiles. A number of these municipalities have indicated, when asked, that the used pesticides must be certified by the Palestinian Ministry of Health (MOH). MOH conducts the needed inspection arrangements and licensing on regularly basis on materials purchased by the municipalities or purchased directly by the MOH and distributed to municipalities for use under special arrangements and consideration of specific mitigation measures.

The developed Palestinian standard used by the MOH and approved by the National Standards Institute is based on the WHO standard. The MDLF has developed the following environmental instructions that should be used during procurement of goods, using and storing of pesticides for those sub-projects aiming at purchasing pesticides. However, the MDLF mitigation measures are based on the international practices accepted by the World Bank and based on the Palestinian environmental policies and standard.

Purchasing of Pesticides

Based on the FAO’s Guidelines for Packaging and Storage of Pesticides (Rome, 1985), the procurement of any pesticide in a Bank-financed project is contingent on an assessment of the nature and degree of associated risks, taking into account the proposed use and intended users. With respect to the classification of pesticides and their specific formulations, the Bank refers to the World Health Organization’s Recommended Classification of Pesticides by Hazard and Guidelines to Classification (Geneva: WHO 1994-95). The following criteria apply to the selection and use of pesticides in Bank-financed projects and sub-projects:

i. They must have negligible adverse human health effects.

ii. They must be shown to be effective against the target species.

iii. They must have minimal effect on non-target species and the natural environment. The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies. Pesticides used in public health programs must be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them.

iv. Their use must take into account the need to prevent the development of resistance in pests.

The Bank requires that any pesticide it finances be manufactured, packaged, labeled, handled, stored, disposed of, and applied according to standards acceptable to the Bank.

In reference to the Local Council Law no.1 for year 1997/Article (15) municipalities in West Bank and Gaza Strip are responsible for protecting and controlling the public health within their villages and cities and conducting the needed arrangements to clean and kill insects, pests, and other reptiles. Those municipalities responsible for purchasing needed pesticides should follow special arrangements specified by the Palestinian Ministry of Health, these instructions are as following:
1. The contractor and pesticide provider should include in the bidding documents a certification indicating that the offered material is licensed by the MOF / MOH as material accepted to be used with no effect on public health;

2. Certifications should be original and written in English or Arabic;

3. The material should include a data sheet clarifying the production date and expiry date clearly, which should not be less than two years from the date of purchasing the material by the municipality;

4. The materials should be inspected by a licensed laboratory (usually it is inspected by the laboratory at the MOH) and the cost of inspection should be covered by the provider;

5. Supply only pesticides of adequate quality, packaged and labeled as appropriate.

6. Pay special attention to formulations, presentation, packaging and labeling in order to reduce hazard to users, to the maximum extent possible consistent with the effective functioning of the pesticide in the particular circumstances in which it is to be used; and

7. Provide, with each package of pesticide, information and instructions in a form and language adequate to ensure safe and effective use.

**Measures for Using and Storing of Pesticides**

Municipalities are used to use the pesticide during the summer semester starting in May till September on a daily basis and at specific time shortly before the sun set. Large municipalities with different residential areas are usually designated into sections for easy access and within the capacity of the municipality and availability of pest-control spraying machines.

The following is a set of mitigation measures that shall be considered before and during spraying process of the pesticides:

1. Specify and inform citizens in advance about the spraying time and nominate in advance the number of workers responsible for the spraying.

2. Supervision of the spraying process should continue during the whole designated spraying period which usually during summer semester.

3. Storage of pesticide should be in a well identified storage space with limited access to those other than municipal staff and inspection teams.

4. Disposal of used canisters or containers should follow the proper international procedures and applicable regulations.

In addition the municipality should comply with the instructions provided in the pesticide package and those instructions promoted by MOH.
Annex 3

Guidelines for Handling of Potential PCB Contaminated Oils and Components

1. INTRODUCTION:

1.1 SUMMARY

The objective of this report is to establish an Environment Impact Plan for handling of Polychlorinated Biphenyls (PCB) and PCB-free insulating oil and insulating oil components at sites that will undergo rehabilitation/ reconfiguration of the distribution network to accommodate construction of the proposed independent transmission grid on the West Bank and Gaza Strip. This report is prepared for the Client Palestinian Energy Authority (PEA) as part of the Environmental Assessment and Management for the Feasibility Study of the Jordan – West Bank and Egypt Gaza Strip Interconnection Project. It is adapted from the impact plan that was prepared for the Southern Electric Company (SELCo) during and after rehabilitation activities in the Electric Sector Investment and Management Project (ESIMP) in 2003. SELCo at that time did not have routines for monitoring, maintenance or record keeping for their oil insulated equipment. It is assumed that similar conditions prevail, also in other utilities. An implementation of such routines would result in a better-structured system, reducing the chances for negative impacts on the environment and the company itself. Monitoring and maintenance forms to be used in routine activities should be established, as well as a system for record keeping.

The report describes routines and procedures for oils and components that both contain and are free for PCBs. It also gives recommendations for tender documents on points that should be included regarding PCB and PCB-free oil and components. The primary focus of this report is to minimize the probability of human, water resource and environment exposure to PCBs. The first important action regarding PCBs is to stop and contain all leaks and to mark all oil-filled components with “PCB-Free”, “PCB!” or “PCB?” labelling. Proper protective wear is necessary for workers dealing with insulating oil and components when the PCB-content is not known.

1.2 INTRODUCTION

1.2.1 Report objective – Environment Impact Plan

The objective of this report is to establish an Environment Impact Plan for utilities during and after rehabilitation activities in the EUMP. The Environment Impact Plan will focus on the handling of PCB and PCB-free insulating oil and insulating oil components at existing distribution substations, as well at possible future substations. Most transformers (or distribution substations) are pole mounted, which means they are mounted on specially designed steel arm arrangements attached to the steel poles or towers carrying the overhead lines, although some transformers are placed on concrete foundations on the ground. In the future, however, utilities may have to construct larger substations, possibly for higher voltages.

The guidelines in this report will apply also for such larger substations. PCB, Polychlorinated Biphenyls, is a group of manufactured chlorinated compounds with many useful characteristics, and have been produced since 1922. They have a low electrical conductivity, a high dielectric constant and have a higher chemical, physical and thermal stability. Unfortunately, PCBs were found to be health hazardous. They can enter the human body through the skin, lungs, and gastrointestinal tract, and are accumulated in fatty tissue. They decompose slowly and tend to bio accumulate in the food chain. PCBs may cause adverse reproductive effects, reduced immunity, behavioural disorder, and tumour development.

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1 This Annex was adopted from the “EAMP - Environmental Assessment And Management Plan for Proposed Interconnection Jordan - West Bank and the Transmission Network on the West Bank” Document which was produced by the Palestinian Energy Authority (PEA) on April 2009.
2. CURRENT STATUS OF HANDLING INSULATING OIL

2.1 GENERAL
The information on current status of oil handling is based on interviews of the operations engineers in the SELCo area in November 2002. Topics such as transformer data, distribution substation monitoring, storage routines, past history of leakage and spills, oil type and handling, and surrounding conditions were covered. It is assumed that the information can be extended to other utilities and therefore used for guidance in the current project.

2.2 STATUS OF PCB-CONTAMINATED INSULATING OIL
ELCO Industries Ltd. of Israel has supplied the majority of SELCo’s transformers. Test certificate for the insulating oil they have used during the last 20 years (i.e. since approx. 1980) are available. The oil is produced by Shell, called “Diala”. The certificate indicates that the analysis procedure for PCBs was the ASTM D4059. Results show “undetectable” amounts of PCB. For the transformers produced prior to 1980, ELCO has stated that those transformers do not contain PCBs. The Israel Electricity Company Ltd. (IEC) has informed the Consultant that they have used Shell Diala insulating oil approximately the last 10 years (i.e. since c. 1992). Prior to this date, oil producer and oil name information has not been made available. The components containing insulating oil from other sources than Shell Diala should be analysed for possible PCB content if additional information is not available.
In conclusion, transformers that have been delivered from ELCO Industries Ltd. of Israel normally contain PCB-free insulating oil. There are several other manufacturers that have supplied transformers to SELCo, including Turkey ABB, EFACEC, ABB, ARDAN, French and Norwegian. The transformers from all these sources were manufactured after 1991 and therefore are considered to have a small probability of containing PCBs. The oldest transformers are from ELCO, manufactured between c. 1965 and 1969. New oil samples should be taken from the oldest transformers and sent for analyses using gas-chromatography testing.
The circuit breakers containing insulating oil from other sources than Shell Diala or PAZ prior to 1992 need to be analysed for possible PCB content if additional information is not available. The analyses should be conducted immediately if the components are leaking or at which time the components are to be decommissioned.

2.3 STATUS OF TRANSFORMER LEAKAGE
Some transformers have at least a slight leakage. Oil filled circuit breakers may also have very small leakages. Leakage normally seems to be caused by two processes. Leakage between gaskets in older transformers appears to be the main form. Apparent leakage is also caused when a transformer is refilled after having been installed or refilled during operation. If transformers are filled passed their maximum, the excess oil will drain from the expansion valve during transformer high-temperatures. A list of transformers that are leaking should be compiled after field survey. The transformers with the highest leakage rate should be attended to immediately. Especially the leaking transformers located close to groundwater wells should be attended to.

2.4 PRESENT SELCO PROCEDURES FOR HANDLING INSULATION OIL

2.4.1 Oil storage
Generally, oil barrels are stored within municipal storage compound fences, each containing about 205 litres with insulating oil. The barrels are often placed outdoors since there usually is not enough indoor storage space.
2.4.2 Refilling procedures
The transformers are occasionally refilled due to leakage or new installation or transportation. Refilling is done manually or, for larger transformers, by using an electric pump from a barrel to the expansion tank. Small spills have occurred during the refilling process, indicated by oil on the expansion tank.

2.4.3 Disposal procedures
The empty barrels are usually refilled with used oil. The barrels with the used oil are sold to the public, generally for heating purposes. The empty tanks are occasionally left lying on ground.

2.4.4 Monitoring procedures
Distribution substations are normally checked at a minimum once a year or when other situations call for more frequent observation.

2.4.5 Record keeping / Labelling procedures
There are very few records kept regarding transformers and insulating oil. Transformers are recorded when purchased, installed, relocated or decommissioned only. Most of the transformers are equipped with data-plates. SELCo does not have any records of insulating oil procurement, volume, use or disposal.

2.4.6 Leakage cleanup procedures
Spilled oil and leaks are generally not dealt with. Spilled oil is left to infiltrate the ground or is absorbed in sand and spread out on the ground. There are no internal guidelines for cleanup procedures.

2.5 OTHER CONDITIONS

2.5.1 Oil filled circuit breakers and cables
There is reportedly no oil-filled cables in SELCo’s distribution network. Some oil-filled circuit breakers do show some leakage, but the volume of leakage is very small. The total volume of oil in each circuit breaker is approximately 20 litres.

2.6 CONCLUSIONS AND RECOMMENDATIONS
These conclusions are based on the condition of electrical distribution equipment as observed in the SELCo area. As mentioned initially it is assumed that similar conditions prevail at other utilities, which again implies that the conclusions and recommendations regards SELCo also are relevant in the context of the EUMP.
First SELCo or the utility in question should improve the conditions at some of the distribution substations where leaking occur. In general it is important to focus on the general conditions and not only on individual sites, with the exception of those sites which pose a possible threat to the environment.
ELCO Industries Ltd. has documented that the insulating oil in the transformers that they have supplied since 1980 do not contain PCBs. They have also indicated in a document that the other transformers supplied prior to 1980 do not contain PCBs. Based on this information, most of the transformers are PCB free.
Some transformers show some degree of leakage. A few have an episodic leakage owing to excess refilling. The main form for leakage is, however, through leaking gaskets in both older and newer transformers. This can probably be remedied partially by routine transformer maintenance. Some of the leaking transformers have such a low estimated rate of leakage that they, with high probability, do not pose a threat to the ground or groundwater under the soil layer, assuming the oil is PCB-free. This is based on the evaluation that the slight amounts of oil which reaches the soil from the
transformer is held absorbed and adsorbed to the soil grains. The oil will decompose with time by natural attenuation. The Consultant suggests that SELCo/ utilities sample the oldest of the leaking transformers. Insulating oil from the oldest transformers should be handled as PCB-contaminated oil, i.e. as hazardous waste (see chapter 3). Refilling of insulating oil free for PCBs may have reduced the possible initial concentration. SELCo/ utilities should carry out ground investigations in areas that have experienced significant oil leakage to assure that soil, ground and groundwater is not contaminated by their activities.

All PCB-contaminated media (oil, transformers, soil, etc.) should be handled as hazardous waste and disposed of in accordance with procedures described in chapter 3 of this report. Handling procedures for insulation oil are at present insufficient. There is a lack of routine and record keeping, such that an overview of the present situation is difficult within SELCo and probably also other utilities.

The next chapters will lay forth routines and procedures that will better secure the electrical substation environment.

3. ENVIRONMENT IMPACT PLAN – PCB HANDLING AND MONITORING PROCEDURES

3.1 GENERAL

This chapter will institutionalise in the Environment Impact Plan procedures and routines for handling PCB-contaminated insulation oil. The procedures and routines are based on the International Finance Corporation (IFC) Environmental, Health and Safety Guidelines for Polychlorinated Biphenyls (PCBs) and the IFC Environmental, Health and Safety Guidelines for Electric Power Transmission and Distribution.

This chapter describes the routines and procedures for labelling, monitoring, spill-cleanup, refilling, transporting, storage, disposal, fire handling, site security, occupational health and safety, and record keeping and inventory of possible PCB-containing insulating oil. The routines and procedures for PCB-free insulating oil will be presented in the next chapter.

3.2 LABELLING

Transformers and other insulating oil components may contain PCBs if not documented otherwise. Especially the older components may hold original oil that is PCB-contaminated. To distinguish between components that are known to contain PCBs and those components that do not or are thought not to hold PCBs, a labelling system should be implemented. The system consists of three categories, including “PCB-Free”, “PCBs?” and “PCBs!”. Table 3.1 indicates the range of PCB concentration in the different categories.

<table>
<thead>
<tr>
<th>PCB - Category</th>
<th>PCB - Concentration</th>
<th>Category Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB-Free</td>
<td>Less than 1 ppm</td>
<td>PCB-testing or documentation from manufacture</td>
</tr>
<tr>
<td>PCB?</td>
<td>Uncertain</td>
<td>Older components and/or unknown oil source</td>
</tr>
<tr>
<td>PCB!</td>
<td>1 ppm or greater</td>
<td>PCB-testing¹, documentation from manufacture or assumed PCB-contaminated</td>
</tr>
</tbody>
</table>

¹ PCB-testing using gas-chromatography methods
Labels should be placed on all components in easily seen places such that employees and contractors can quickly identify which precautions that need to be taken when handling the insulating oil and component.

3.3 MONITORING
Monitoring in the Environment Impact Plan pertains mainly to the components at substations. Monitoring should be conducted regularly, at least once every third month, but more often at sites that require closer follow-up. Records should be kept regarding any leakage, damage, failures and/or maintenance to the component. Information that should be gathered and archived for at least three years includes:

- Site name and component identification
- Dates of previous inspections and the date leakage/failure was discovered
- Person inspecting components
- Location of leak(s)
- Estimated amount of insulating oil released due to the leak(s)
- Date of any cleanup, containment, repair or replacement
- Description of any cleanup, containment or repair performed
- The results of any containment and daily inspection required for uncorrected active leaks.

In the case of any leakage from a component that is known to or may contain PCBs, immediate and direct actions need to be taken to stop the leak and the spreading of the oil. Cleanup is necessary immediately after the leakage has been stopped.

Monitoring should also include keeping the substation tidy and calling for assistance if maintenance is required.

If a component labelled with “PCB!” is leaking, damaged or has a failure, it should be decommissioned and disposed of in a proper manner (see the chapter on Disposal).

If a component labelled with “PCB?” is leaking, damaged or has a failure, it should be sampled immediately and analysed for PCBs using gas-chromatography testing. While waiting for the laboratory results, spill oil and the component itself needs to be contained. If the component contains PCBs, it should be decommissioned and disposed of accordingly (see section on Disposal).

Precautions should be taken by the inspectors who monitor components containing or thought to contain PCBs, in order to avoid health risks (see section on Occupational Health and Safety).

Appropriate safety wear and sampling equipment should be implemented when coming in close contact with possible PCB-contaminated oil.

3.4 SPILL CLEANUP
After the spill has been contained by dikes, trenches, buckets/pans and absorbing material (e.g. sawdust or sand), cleanup of the affected surfaces should commence directly, i.e. within 48 hours after the leakage has been discovered. The following procedures should be followed (assume PCB contamination if the source is not be documented otherwise):

- Excess oil needs to be removed and placed in appropriate containers with lids
- All contaminated solid surfaces must be double washed and rinsed
• All soil within the spill area must be excavated and the ground be restored to its original configuration by back-filling the area with clean soil
• Contact experts regarding case-to-case cleanup and risks to surrounding recipients

Spill cleanup should be aimed at containing the spill, and removing the spill from the area to be disposed of properly. Main concerns in the case of a spill are exposure to recipients, primarily humans and water resources (i.e., surface water, groundwater, etc.).

Cleanup crew will need to wear and use adequate protection gear to prevent exposure to PCBs (see chapter on “Occupational Health and Safety” below).

3.5 REFILLING
If a possible or definite PCB-contaminated component needs routine maintenance, but is in otherwise in good condition, it can remain in service under routine monitoring. Any refilling of insulating oil due to routine maintenance shall be done with PCB-free oil.

Where possible, the complete removal of PCBs from equipment and replacement with non-PCB fluids is recommended.

Care should be taken not to spill oil during refilling. Spilled oil should be wiped off the component so that leaks from the component can be easily recognised and dealt with, and not be confused with refilling spills. It is also important not to refill past the maximum expected transformer-temperature volume. Excessive oil causes oil leakage by way of the expansion valve when a component reaches high temperatures.

3.6 TRANSPORT
All components that contain or may contain PCBs must not be transported unless the component has been securely contained and packaged, including:

• A leak proof inner package made of earthenware, plastic or metal
• An outer package that is either; a drum made of steel, aluminium, plywood, fibre or plastic, or a box made of wood, plywood, reconstructed wood or fibreboard
• Sufficient absorbent material (capable of absorbing 110% of the internal volume of the packaged component) placed between the inner and outer packaging to prevent any liquid from escaping from the outer packaging. “Absorbent material” includes any material such as vermiculite, sawdust, coconut fibre, or any of various other natural fibres that are inherently absorbent

The insulating oil components that have uncertain amounts of PCBs are to be tested using gaschromatography methods prior to transportation.

3.7 STORAGE
Storage of PCB-contaminated insulating oil and components is a temporary phase prior to proper disposal of both the oil and the component. Storage of PCBs should not exceed 30 days. Both the oil and the components are to be stored in a protection package as described in the previous chapter, “Transport”. The packaged containers containing the PCB-contaminated oil and components require a storage facility that secures the component from damage, the weather elements and unauthorised personnel.

The storage facility must meet the following criteria:
• Adequate roof and walls to prevent rain water from reaching the stored components
• A concrete floor having continuous curbing so that the floor and curbing provide a containment volume equal to at least two times the internal volume of PCB component/container or 25% of the total volume of PCB containers stored therein.

• No drains, joint lines, sewer lines, or other openings that would allow fluids to flow from the curbed area.

### 3.8 DISPOSAL

Insulating oil contaminated with PCBs can be disposed of by employing four different methods. The preferred method of destruction is high temperature incineration. A minimum temperature of 1,200 °C and residence time over two seconds achieves 99.99% destruction. With PCB-concentrations between 50-500 ppm, high-efficiency boilers can be used to destroy the PCBs. There are several criteria that must be met, however, including:

• The boiler must be rated at a minimum of 14.6 MW

• For gas- or oil-fired boilers, the carbon monoxide (CO) concentration in the flue gas must be less than 50 ppm

• For coal-fired boilers, the CO concentration in the stack cannot exceed 100 ppm

• Excess oxygen must be at least 13%

• The waste cannot exceed 10% by volume of the total fuel fed to the boiler.

• Waste can only be fed into the boiler when it is at operating temperature (feed during start-up or shutdown is prohibited).

• Specific process-monitoring and operating procedures must be followed Another option is chemical de-chlorination. This is a process that breaks down PCBs by liberating chlorine atoms. Once broken down, chlorine is separated into its various salts enabling ready disposal of all fluids and substances.

Independent of which method is chosen, the facility that is to conduct the destruction of the PCBs is to be a certified institution for PCB-disposal.

Components that have contained PCB-contaminated insulating oil should first be cleaned with a solvent to rinse out excess PCB-oil. Solvents may include kerosene, xylene, toluene, and other solvents in which PCBs are readily soluble (5% or more). The PCB-contaminated solvent is to be disposed of in the same manner as the insulating oil described above. The components themselves can be delivered in packaged form (as described in the chapter on Transport) to a certified landfill specially designed to accommodate hazardous materials. If the landfill also accepts PCB contaminated fluids, this may also be a disposal solution for the insulating oil and solvent.

### 3.9 FIRE HANDLING

A major concern regarding fires and PCB-contaminated insulating oil is the formation of PCDFs (polychlorinated dibenzofurans). Preventive measures include the following:

• Provision of information and training of personnel

• Proper identification of equipment containing PCBs (see chapter on Labelling)

• Installation and maintenance of protective systems (e.g., fire alarms, extinguishers, emergency electrical cut-off, and control of leaking PCB fluids, vapours or soot)

• Preparation of an emergency response plan

A fire prevention and fire safety program should be implemented and include regular drills.
3.10 SITE SECURITY
The substation sites must be secured against unauthorised personnel to prevent against accidental exposure to PCBs and high voltage. The fenced in sites should be maintained to prevent unwanted entrance by unauthorized personnel and to provide for safe working conditions.

3.11 OCCUPATIONAL HEALTH AND SAFETY
The following text is entirely from the IFC Environmental, Health and Safety Guidelines for PCBs. When handling PCB fluids, or when the potential for close contact with PCBs exists (e.g., leakage inspections; spill cleanup; transfer from transformer to drums, etc.), proper clothing and gear must be worn to prevent contact with skin and eyes from spills, splashes and, also, to prevent inhalation of fumes which may be generated when PCB fluids are heated above 55 ºC. In any operation where there is risk of contact, plastic or rubber clothing should be worn, including gloves, boots or overshoes, overalls and a bib-type apron, which covers the boot tops. Eye protection is also necessary. Chemical safety goggles, face shields or safety glasses with side shields are all satisfactory. For major spill cleanup activities, a full suit of non-porous material may be appropriate. Clothing that has become contaminated should be disposed of as a PCB waste rather than attempting to decontaminate and reuse it. Handling of hot PCB fluids should be avoided. A full face respirator is required when fluid temperatures exceed 55 ºC. Ventilation of the working area must also be sufficient to remove generated vapours.

3.12 RECORD KEEPING AND INVENTORY
Record keeping and inventory is especially important with regards to keeping order in PCB components. Ideally, inventory should follow the “cradle-to-grave” principle, i.e. the inventory should track, e.g., insulating oil from when it is purchased to when it is sold/disposed of after use. This is necessary to indicate if all of the oil can be accounted for during its period with the company. If the inventory does not balance, investigations should be carried out to discover if the sinks can be identified. In this project, regarding PCB-contaminated oil and components, record keeping and inventory will have to begin with the monitoring and maintenance of existing installations.

Monitoring data, testing data, inventory, maintenance, accidents, occupational illnesses, leaks and spills, and other emergencies need to be archived in records. This information needs to be reviewed, evaluated and reported once every year to improve the effectiveness of the Environment Impact Plan program.

3.13 RECOMMENDATIONS
SELCo and other utilities owns transformers (primarily small, distribution transformers) and low voltage capacitors. Many of the components are relatively old, and therefore might contain PCBs. Those components that are leaking need to be repaired, at which time a PCB-test is required if the PCB-content is not known. The test will determine which procedures that need to be followed regarding oil and component handling. After a period of PCB-testing, SELCo/ utility should establish an archive of component and oil-manufactures which have delivered/not delivered PCB contaminated units, at which time fewer PCB-tests will be required.

Labelling of all transformers and capacitors needs to be initiated immediately. This will reduce the probability of PCB-contamination of employees, contractors and the surrounding environment during the rehabilitation activities and in future tasks. Transformers and components filled with insulating oil from manufactures that have documented PCB-free products can be labelled with “PCB-Free”. The other components need to be labelled either “PCB?” or “PCB!”.

SELCo/ utility should as soon as possible strive to establish standard forms and routines for monitoring and maintenance, such that the environmental conditions at the substations are at an
appropriate level. Monitoring activities should also result in a better structured system, where situations like empty oil drums and littered compounds are not left unattended.

SELCo/ utility should also establish a catalogue of available experts that can assist in the case of a spill and cleanup event. A list of laboratories and disposal sites that can receive PCB-contaminated oils and components also needs to be established.

4. ENVIRONMENT IMPACT PLAN - HANDLING AND MONITORING INSULATING OIL

4.1 GENERAL
This chapter will institutionalise in the Environment Impact Plan procedures and routines for handling PCB-free insulation oil. The procedures and routines are based partially on the International Finance Corporation (IFC) Environmental, Health and Safety Guidelines for Electric Power Transmission and Distribution.

This chapter describes the routines and procedures for labelling, monitoring, spill-cleanup, refilling, storage, disposal, fire handling, site security, occupational health and safety, and record keeping and inventory of PCB-free insulating oil.

4.2 LABELLING
All insulating oil containers, including refilled oil drums need to be labelled regarding PCB-content (see chapter 3, “PCB handling and monitoring procedures”). Refilled oil drums also need to be labelled showing the type and quantity of used oil, where the oil came from and the date the refilling occurred. The data should also be noted in the records and inventory archive. These routines will allow for the tracking of all oil and containers during its period with the company.

4.3 MONITORING
Monitoring in the Environment Impact Plan pertains mainly to the components at the substations. Monitoring should be conducted regularly, at least once every third month, but more often at sites that require closer follow-up. Records should be kept regarding any leakage, damage, failures and/or maintenance to the component. Information that should be gathered and archived for at least three years includes:

- Site name and component identification
- Dates of previous inspections and the date leakage/failure was discovered
- Person inspecting components
- Location of leak(s)
- Estimated amount of insulating oil released due to the leak(s)
- Date of any cleanup, containment, repair or replacement
- Description of any cleanup, containment or repair performed
- The results of any containment and daily inspection required for uncorrected active leaks

In the case of any leakage from a component that is known to or may contain PCBs, immediate and direct actions need to be taken to stop the leak and the spreading of the oil (see chapter 3). Cleanup is necessary immediately after the leakage has been stopped.

Monitoring should also include keeping the substation tidy and calling for assistance if maintenance is required.
4.4 SPILL CLEANUP
After the spill has been contained by dikes, trenches, buckets/pans and absorbing material (e.g. sawdust or sand), cleanup of the affected surfaces should commence directly, i.e. within 48 hours after the leakage has been discovered. The following procedures should be followed:

• Excess oil needs to be removed and placed in appropriate containers with lids
• All soil within the spill area must be excavated and the ground be restored to its original configuration by back-filling the area with clean soil
• Contact experts regarding case-to-case cleanup and risks to surrounding recipients if more than approximately 10 litres oil has infiltrated the ground.

Spill cleanup should be aimed at containing the spill, and removing the spill from the area to be disposed of properly. Main concerns in the case of a spill are exposure to recipients, primarily humans and water resources (i.e., surface water, groundwater, etc.).

4.5 REFILLING
Care should be taken not to spill oil during refilling. Spilled oil should be wiped off the component so that leaks from the component can be easily recognised and dealt with, and not be confused with refilling spills. It is also important not to refill past the maximum expected transformer temperature volume. Excessive oil causes oil leakage by way of the expansion valve when a component reaches high temperatures.

4.6 STORAGE
The components and containers containing the insulating oil require a storage facility that is secure from destruction, the weather elements and unauthorised personnel. The storage facility should be designed with secondary containment (e.g. dikes, berms) to prevent spills and the contamination of soil, groundwater and surface waters.

The storage facility should meet the following criteria:

• Adequate roof and walls to prevent rain water from reaching the stored components and oil containers
• A concrete floor having continuous curbing so that the floor and curbing provide a containment volume equal to at least two times the internal volume of component/container or 25% of the total volume of containers stored therein
• No drains, joint lines, sewer lines, or other openings that would allow fluids to flow from the curbed area

Local storage at individual substations or other facilities, where applicable, should also meet the same criteria.

4.7 DISPOSAL
PCB-free oil can be disposed of by various acceptable means. It can be resold to the refining company for re-refining. It can also be resold to the supplier for recycling. The used oil can be sold directly to consumers for fuel oil if national regulations allow it. Without sufficient filtering, the waste oil may contain trace metals and toxic chemicals.

4.8 FIRE HANDLING
Fire prevention systems should be provided for storage facilities and at substations. Preventive measures include the following:

• Provision of information and training of personnel
• Proper identification of components and their contents (e.g., PCBs)
• Installation and maintenance of protective systems (e.g., fire alarms, extinguishers, emergency electrical cut-off, and control of leaking fluids)
• Preparation of an emergency response plan

A fire prevention and fire safety program should be implemented and include regular drills.

4.9 SITE SECURITY
The substation components must be secured against unauthorised personnel to prevent against accidental electrocution and damage of the substations. Depending on the type and size of substation, the best security is to place the transformers and circuit breakers on pole mounted arms at secure height above ground, or indoors in a locked building. Alternatively, fenced-in compounds should be maintained.

4.10 OCCUPATIONAL HEALTH AND SAFETY
There are few hazards related to handling insulating oil. Precautions should be made, however, to secure safe working conditions, e.g., regarding electrocution and excess oil on pole mounted arms and on floors where applicable. A safety program should be established for construction and maintenance work.

4.11 RECORD KEEPING AND INVENTORY
Record keeping and inventory is important with regards to keeping order in of insulating oil and components through their period in commission. Ideally, inventory should follow the “cradle to grave” principle, i.e., the inventory should track, e.g., insulating oil from when it is purchased to when it is sold/disposed of after use. This is necessary to indicate if all of the oil can be accounted for during its period with the company. If the inventory does not balance, investigations should be carried out to discover if the sinks can be identified. In this project, record keeping and inventory will have to begin with the monitoring and maintenance of existing installations.

Monitoring data, testing data, inventory, maintenance, accidents, occupational illnesses, leaks and spills, and other emergencies need to be archived in records. This information needs to be reviewed, evaluated and reported once every year to improve the effectiveness of the Environment Impact Plan program.

4.12 RECOMMENDATIONS
SELCo/ utilities should as soon as possible strive to establish standard forms and routines for monitoring and maintenance, such that the environmental conditions at all types of substations are at an appropriate level. Monitoring activities should also result in a better structured system, where situations like empty oil drums and littered compounds are not left unattended.

Transformers are at present installed on steel arms mounted in the steel towers and in some cases situated on concrete slabs without dikes or berms. Spills and leaks will run off the transformers onto the ground and infiltrate the soil. The transformers mounted on concrete slabs should be equipped with berms or dikes at the perimeter of the slabs. The surface could also be covered with an imperious material to prevent soaking of the concrete will spill oil. This material could be an epoxy that does not react with the insulating oil.

Ground mounted new substations or substations to be rehabilitated should be equipped with transformer foundations designed with an oil catchment structure in accordance with present international standards.
2.1 Palestinian Environmental Law

The Palestinian environmental legal and administrative framework has taken major strides towards protecting environmental resources and institutionalizing their sustainable management. The Environment Law of Palestine is comprehensive, covering the main issues relevant to environmental protection and law enforcement. Among the objectives of the law are:

- Protecting the environment from all sorts and types of pollution
- Protecting public health and social welfare
- Incorporating environmental resources protection in all social and economic development plans and promote sustainable development to protect the rights of future generations;
- Conserving ecologically sensitive areas, protecting biodiversity, and rehabilitating environmentally damaged areas;
- Setting inter-ministerial cooperation regulations and standards various environmental protection areas and jurisdictions;
- Promoting environmental information collection and publication, public awareness, education and training.

The law addresses various environmental issues including:

- Management and protection of various resources. Issues covered are related to land environment, air environment, water resources and aquatic environment, and natural, archeological, and historical heritage protection.
- Environmental Impact Assessment (EIA) and auditing, permitting of development projects, monitoring of environmental resources and their parameters.
- Penalties to be applied in case of violation of any article presented under the law.
- Other issues addressed by the legislation include emergency preparedness, public participation, research training and public education.

The Environment Law of Palestine of 1999 has stated in Chapter 1 (of section III), article 45, “The Ministry, in coordination with the competent agencies, shall set standards to determine which projects and fields shall be subject to the environmental impact assessment studies. It shall also prepare lists of these projects and set the rules and procedures of the environmental impact assessment”.

Article 47 of the Environmental low states that "The Ministry, in coordination with the competent agencies, shall determine the activities and projects that have to obtain an environmental approval before being licensed. This includes the projects that are allowed to be established in the restricted areas”.

2.2 Palestinian Environmental Assessment Policy

The Palestinian Ministerial Council approves the Palestinian Environmental Assessment Policy, through resolution No: 27-23/4/2000. This Policy shall be interpreted and implemented to support the sustainable economic and social development of the Palestinian people through assisting in meeting the following goals:
1. Ensuring an adequate standard of life in all its aspects, and not negatively affecting the basic needs, and the social, cultural and historical values of people as a result of development activities.
2. Preserving the capacity of the natural environment to clean and sustain itself.
3. Conserving biodiversity, landscapes and the sustainable use of natural resources.
4. Avoiding irreversible environmental damage, and minimizing reversible environmental damage, from development activities.

There are two types of Environmental Assessment (EA) reports that represent sequential stages in the project life cycle and the EA review process: 1) an Initial Environmental Evaluation (IEE), and 2) an Environmental Impact Assessment (EIA). The Ministry shall provide guidance on the content and preparation of these reports. The Initial Environmental Evaluation (IEE) is for projects where significant environmental impacts are uncertain, or where compliance with environmental regulations must be ensured; whereas An Environmental Impact Assessment (EIA) is required for projects, which are likely to have significant environmental impacts. An EIA may be carried out as a result of an IEE.

Based on the Application for Environmental Approval, screening criteria are used to determine whether an Initial Environmental Evaluation or an Environmental Impact Assessment (or none of them) is required for a project. An Environmental Impact Assessment (EIA) shall be conducted for the following types of major development projects:

1. Power plants (including gas turbines, substations and super tension lines)
2. Quarries and mines
3. Wastewater treatment plants including main sewers
4. Cement plants
5. Solid waste disposal sites
6. Hazardous waste disposal sites
7. Plants producing, storing or using hazardous substances
8. Airports and landing strips
9. Seaports, jetties and harbors
10. Refineries
11. Industrial estates
12. Major dams and reservoirs
13. Major roads
14. Steel mills

For project types not listed above, a determination of whether or not an IEE or an EIA must be conducted will be based on screening criteria. Extensions to existing projects of the types listed above shall be subjected for the need for IEE or EIA studies.

The project proponent must first obtain initial approval from the appropriate Ministry or Local Planning Committee. The proponent then submits an Application for Environmental Approval to the Ministry. The Ministry will notify the appropriate permitting authorities that an Application for Environmental Approval has been received and that an EIA is required.

For projects not above, the proponent submits the Application for Environmental Approval to the appropriate permitting authorities as part of his overall application package for initial approval. These authorities then refer the project to the Ministry. The Ministry may ask the proponent for further information to ensure the Application is sufficient for consideration under the EA Policy.
consultation with these authorities and others through the EA Committee as required, the Ministry then applies the screening guidelines and determines whether an IEE Report or an EIA Report is required. If an IEE Report or EIA Report is not required, the Ministry will determine, in coordination with the relevant permitting authorities or the EA Committee as required, whether or not Environmental Approval will be granted and, if so, under what conditions.

Once the Ministry considers that an Application for Environmental Approval is complete, it has a maximum of 14 business days to determine the need for an IEE or an EIA Report, or to determine whether Environmental Approval will be granted based on the Application alone. If this deadline is not met, the proponent has the right to submit a written complaint to the Minister, who must respond in writing within a week from receipt of the complaint.

The Screening process will be based on requirements of relevant land use plans, and on whether the project is likely to:

1. Use a natural resource in a way that pre-empts other uses of that resource,
2. Displace people or communities,
3. Be located in or near environmentally sensitive areas such as natural reserves, wetlands, or registered archeological and cultural sites,
4. Generate unacceptable levels of environmental impact,
5. Create a state of public concern, or
6. Require further, related development activities that may cause significant environmental impacts.

Without limiting its content, an Environmental Approval may specify:
- Required measures to mitigate adverse environmental impacts or capture potential environmental benefits, including a compliance schedule,
- Measures that the proponent must implement in order to comply with relevant standards and requirements; and
- Monitoring and reporting duties of the proponent.

For existing projects and developments, Environmental Auditing (EAu) may be required. Its aim is to mitigate negative environmental impacts through evaluating their environmental management and performance. An environmental audit is prepared by the owner or operator of the development activity, and focuses on mitigation measures for existing environmental impacts to comply with relevant environmental standards and regulations. Decisions resulting from an Environmental Audit Report can include:

a) Suspension of the permit for the development activity by the permitting authority until specified measures are implemented;
ii) Agreement on conditions that will be applied to the development activity, including a plan of implementation; or
iii) Exemption of the development activity from further compliance with the EA Policy.